



Research Article

Potential of ethnobotanical medicinal plants used by Malayali tribes in Yercaud hills, Eastern ghats of Tamil Nadu, India

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Abstract

Ethnobotanical knowledge plays an important role in therapeutic beneficial by traditional people of the Yercaud hills, Eastern ghats of the State Tamil Nadu. This current study focused on documentation of medicinal plants used to treat several ailments. Enlightenment of medicinal plants data was gathered from the Malayali tribes, using an integrated approach like botanical collections, group discussion and interviews with questionnaires in the year 2018 – 2019. During the survey a total number of 40 ethnomedicinal plant species belonging to 38 genera and 25 families were documented. Traditional names of the plants by traditional healers and local community members were prepared as a checklist. The checklist of medicinal plants used by Malayali tribes are listed with botanical name, vernacular name, family, parts used, mode of preparation, mode of admiration and medicinal uses. We observed that the documented ethnomedicinal plants were commonly used to treating snakebite, earache, chest pain, body pain, lumbago, eczema, haemorrhoids, jaundice, dog bite, sprain, beetle bite, epididymitis, bone fracture, arthritis and painful menstruation. The results of this study showed that the tribal people still depended on medicinal plants in Yercaud Hills for treating various diseases. This would be a baseline data of medicinal plants for future research and potential development of novel drugs.

Keywords: Documentation, Eastern Ghats, Medicinal plants, Malayali tribes, Yercaud Hills

INTRODUCTION

The ethnomedicinal system and herbal medicine is a healing agent of chief importance in addressing health care problem of traditional communities (Tilahun and Moa, 2018). The therapeutically vital plants are known to be used by folkloric people to treat various diseases such as diabetes, dysentery, fever, headache, rheumatism, snakebite, cough and some as food and food additives (Tripuresh *et al.*, 2019). A large helping of the world population, particularly in developing countries, depends on traditional medicine for the treatment of diseases and wounds. The World Health Organization reported that 80% of the world populations trust mainly on indigenous medicine and that the common of traditional therapies involve the use of plant extracts or their dynamic constituents (Fabricant and Farnsworth, 2001).

A tropical country like India having a rich diversity of medicinal plants formally recognizes nearly about 8,000 species with their medicinal value. Globally, about 85% of the traditional medicines used for primary health care are derived from plant parts uses with a great number of tribal people who are living in different geographic locations with various subsistence patterns (Abubacker *et al.*, 2018 and Sathishkumar and Anbarasu, 2019). These tribal groups living in biodiversity-rich areas possess a wealth of knowledge on the utilization of medicinal plants to relive people from various diseases and illness without any side effects. Traditional medicine and ethnobotanical information can provide valuable clues for the selection, preparation and indications for the use of herbal formulation in the field of scientific research especially for the discovery of plant-based drugs. This traditional knowledge of

medicinal plants handed over to generation to generation without any written document and also it has helped them to have a sense of responsibility in judicious utilization of the plant resources and also to conserve (Premkumar and Sundarajan, 2018).

There is vast information on the use of indigenous medicinal plants in Yercaud over the last periods. In light of this, therefore, there is a high expectation of vast traditional knowledge of medicinal plant species in Yercaud hills due to the use of diverse plant species, variety of cultures, various languages, and views among the different ethnic groups in Yercaud. To our information, there are no data about the traditional medicinal plant knowledge and use by several local communities in Yercaud. Moreover, Yercaud is one of the experiencing dynamic changes in cultural norms and system, which renders the traditional and local knowledge of medicinal plants to be easily forgettable as most of the indigenous traditional knowledge is moved to the local community members orally. Therefore, the current study revealed to assess and document the medicinal plants use among the traditional healers and local community members in and around the Yercaud hills.

MATERIALS AND METHODS

The present investigation was undertaken to collect information from Malayali tribes on the use of medicinal plants from Yercaud Hills, Tamil Nadu. Fieldwork in tribal areas was the most important part of all ethnobotanical research.

Before starting with fieldwork, preliminary information about the geographical area of study, its physiographical features, climate etc. were collected. A general idea about the tribal community was acquired from the publication of Malayali tribes. With the help of the Yercaud map (Fig. 1), the tribal hamlets to be visited were located. Means of conveyance and easiest route to each village from the research station were identified, and frequent field surveys were carried out in Yercaud hills in different seasons during 2014-2016. The information was accrued after discussions with sixty-three tribal persons, the village head, elderly persons and other local informants. Ethnobotanical data were collected using semi-structured interviews, group discussion, guided field walks, and observations with participants. Uses of plants as given by them were recorded and voucher specimens were also collected simultaneously, for authentication of information and future record through herbaria. The collected ethnomedicinal information was recorded on field notebooks and plants were identified using the Flora of the Presidency of Madras (Gamble and Fischer 1935) and Flora of Tamil Nadu-Carnatic (Mathew, 1983).

RESULTS AND DISCUSSION

The present exploration revealed that 40 plant species belonging to 38 genera of 25 families were used by Malayali tribes for treating various ailments like a snake bite, earache, chest pain, body pain, lumbago, eczema, haemorrhoids, jaundice, dog bite, sprain,

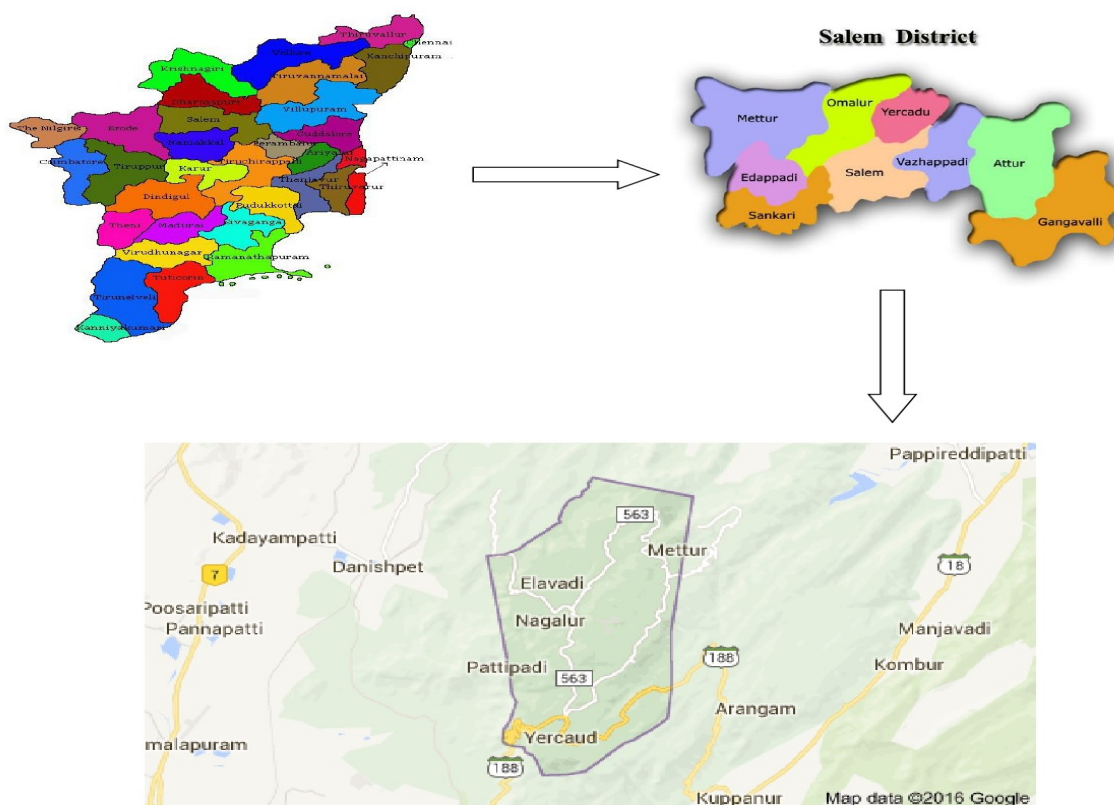


Fig. 1. Location of study area map showing in Yercaud hills.

Table 1. List of Ethnomedicinal plants used by Malayali tribes in Yercaud Hills, Eastern Ghats, Salem District, Tamil Nadu.

Botanical Name	Vernacular Name	Family	Sources of Preparation	Route of Administration	Phytochemical compounds
Antidote for poisonous bite					
<i>Erythroxylum monogynum</i> Roxb.	Sembulichaana	Erythroxylaceae	Bark is ground to powder	Powdered bark is administered with a cup of hot water for 4 days for the treatment of beetle bite	Hibaeneepoxide, Monogynol, Devodarool, Alkaloids, Diterpenes such as erythoxydiol, erythoxytriol, Hydrocarbons, primaradien, Isoatisirene, Atisirene, Devadorene and erythoxytriols Q and P (Dhanunjava et al., 2019)
<i>Clausena dentata</i> Willd.	Annaikattipalam	Rutaceae	Roots of <i>Clausena dentata</i> Willd. are mixed with roots of <i>Calotropis gigantea</i> R.Br and bark of <i>Cassia fistula</i> L ground to powder and mixed together Mixture of leaves of <i>Aris-tolochia bractolata</i> Retz with leaves of <i>Hemidesmus indicus</i> R.Br and roots of <i>Tephrosia pumila</i> Baker ground to powder and mixed together	A prepared mixture of powder is taken in a cup of hot water and given orally to get rid of snake venom.	Alkaloids, Carbohydrates, flavonoids, phenols, proteins, saponins, steroids and tannins (Prathapa et al., 2016)
<i>Aristolochia bracteolata</i> Retz	Aaduthinnapalai	Aristolochiaceae	Decoction obtained by adding small pieces of <i>Tylophora asthmatica</i> W. and Leaves with the bark of <i>Cassia fistula</i> L and leaves of <i>Leucas aspera</i> Spreng to boiling water	A mixture of powder is taken in a cup of hot water and given orally for 4 days for snake bite	Coumarins, Steroids, Phenols, Terpenoids, Tannins, Flavonoids, Glycosides and Carbohydrates (Trajee and Latha, 2016)
<i>Tylophora asthmatica</i> W. and A.	Pillunangai	Asclepiadaceae		Decoction of this preparation is taken orally for 7 days for snake bite	
Arthritis					
<i>Ruta graveolens</i> L	Agaravagaram	Rutaceae	Leaves of <i>Ruta graveolens</i> L and Rhizome of <i>Drynaria quercifolia</i> (L.) Jare ground to powder and mixed together, and the powder is added to the boiling oil	Chirm is applied externally on the painful region for arthritis	Phenols, glycosides, triterpenoids, phenolic compounds, glycolipids and steroids (Teklit and Tanveer, 2015)
Body pain					
<i>Capparis divaricata</i> Hk.f. and T	Sellapattai	Capparidaceae	Mix bark of <i>Capparis divaricata</i> Hk.f. and T with bark of <i>Dalbergia latifolia</i> Roxb, <i>Gmelina arborea</i> Roxb, <i>Grevia tiliaefolia</i> Vahl and <i>Lannea coromandelica</i> (Houtt.) Merr ground to powder and mixed together	A prepared mixture of powder is mixed in a cup of hot water and is given orally for 3-4 days to relieve the body pain	Alkaloids, Carbohydrates, tannins, glycosides, phenolic compounds and flavonoids (Hirave and Kondawar, 2016)
<i>Cardiospermum helicacabum</i> L	Mudakkathan	Sapindaceae	Decoction prepared by boiling of leaves of <i>Cardiospermum helicacabum</i> L. along with roots of <i>Centella asiatica</i> Urb in water.	A decoction is given orally for 10 days for body pain	Steroids, triterpenoids, sugars, alkaloids, phenols, saponins, amino acids, tannins and anthracene glycosides (Maluventhanviji et al., 2016)

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Table 1. Contd.....

Bone fracture					
<i>Holarrhena pubescens</i> (Buch. Ham.) Wall.ex.G.Don	Kudasapali	Apocynaceae	Bark is crushed and a paste is prepared in water	Paste is applied externally for Bone fracture	Flavonoids, cardiac glycosides, saponins, steroids, volatile oil, alkaloids, amino acids, protein and reducing sugar (Turendra and Makeskaware, 2019)
Chest pain					
<i>Solanum lycopersicum</i> Linn	Thakalai	Solanaceae	Leaves are crushed and soaked in a cup of water Mix bark of <i>Diospyros ebenum</i> Koen with leaves of <i>Leucas aspera</i> Spr and bark of <i>Hiptage madablotia</i> Gaertn, <i>Lannea coromandelica</i> (Houtt.) Merr, <i>Randia malabarica</i> Lam, <i>Syzgium cumini</i> (L.) Skeels, <i>Terminalia chebula</i> Retz and <i>Toddalia asiatica</i> Lam ground to powder and mixed together	Infusion is given orally for 10 days before breakfast	Reducing sugar, tannins, flavonoids, steroids, saponins and alkaloids (Homaria et al., 2016)
<i>Diospyros ebenum</i> Koen	Karugaali	Ebenaceae		Prepared mixture of powder is in a cup of hot water and given orally for chest pain	Triterpenes, carbohydrates, flavonoids and tannins (Khaled Nabilh 2013)
Dog bite					
<i>Cassia occidentalis</i> L	Utharam	Caesalpinaceae	Leaves are crushed and a paste is prepared in water	The paste is tied over the dog bitten area	Alkaloids, Saponins, Flavonoid, anthraquinones and tannins (Nnama et al., 2018)
Ear ache					
<i>Leucas aspera</i> Spr	Thumbai	Lamiaceae	Juice obtained by crushing and squeezing of leaves	Leaves juice extract is poured into the ear	Terpenes and Terpenoid, sterols and fatty compounds, Glycosides, flavonoid and Lignane compound (Priya et al., 2018)
<i>Solanum melongena</i> L	Kathirikai	Solanaceae	Juice obtained by crushing and squeezing of leaves	Leaves juice extract is poured into the ear	Tannins, saponins, alkaloids, flavonoids and phenols (Bader Omer Burham et al., 2016)
Eczema					
<i>Mukia madraspatana</i> (L.) Roem	Musumusukkai	Cucurbitaceae	Raw fruits	Raw fruits are scrubbed on the affected part externally to prevent the eczema	Tannins, saponin, flavonoids, steroid, terpenoids and cardiac glycerides (Gomathy et al., 2012)
<i>Plumeria rubra</i> L	Paalarali	Apocynaceae	Raw latex	Fresh latex is applied externally to prevent the eczema	Sterols, Terpenoids, carbohydrates, proteins, Alkaloids, saponins, tannins, mucilages and volatile oil (Dhanapal et al., 2018)
Epididymitis					
<i>Cynodon dactylon</i> Pers	Arugampullu	Poaceae	Small sized pills are prepared from whole plant parts of <i>Cynodon dactylon</i> Pers and <i>Mimosa pudica</i> L	These pills are given orally for 7 days to cure epididymitis	Sterols, terpenoids, carbohydrates, flavonoids, proteins, alkaloids, saponins and tannins (Dhanapal et al., 2018)

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Table 1. Contd.....

Hemorrhoids					
<i>Aloe barbadensis</i> Mill	Katralai	Liliaceae	Leaves of <i>Aloe barbadensis</i> Mill and <i>Mimosa pudica</i> , Linn crushed and a paste is prepared with water	Paste is mixed with cow milk and given orally for hemorrhoids	Alkaloids, saponins, tannins, sterols, flavanoids and phenol (Darshan <i>et al.</i> , 2017)
Jaundice					
<i>Cassia auriculata</i> L	Avarai	Caesalpinaceae	Raw flowers	Fresh flowers are administered to the patients till cure jaundice	Alkaloids, carbohydrate, fixed oil and fats, Tannins, phenols, gum and Mucilage, flavonoids, saponins and sterols (Devadaskumarasamy <i>et al.</i> , 2013)
Lumbago					
<i>Asclepias curassavica</i> L	Mokkuthipoodu	Asclepidaceae	Juice obtained by crushing and squeezing of leaves of <i>Asclepias curassavica</i> L, <i>Canthium parviflorum</i> Lam, <i>Indigofera cassioides</i> L and <i>Pergularia daemia</i> (Forsk.) chiov	Leaves juice extract is mixed with milk and is given orally for 2 days to cure lumbago	Steroids, glycosides, phenols, tannins, saponin and proteins and amino acids (Varsha and Meeta, 2019)
Painful menstruation					
<i>Azadirachta indica</i> A. Juss	Vembu	Meliaceae	Bark is added to boiling water	This water is given orally to cure painful menstruation	Alkaloids, flavanoids, glycosides, Reducing sugar, tannins, saponins, polysaccharides, phytosterols and phenols (Priya <i>et al.</i> , 2018)
Sprain					
<i>Datura metel</i> L	Umathai	Solanaceae	Leaves are crushed and a paste is prepared in water	Paste is applied externally for sprain	Steroids, alkaloids, flavanoids, saponins, triterpenoids, phenols and glycosides (Vaidyanathan <i>et al.</i> , 2014)

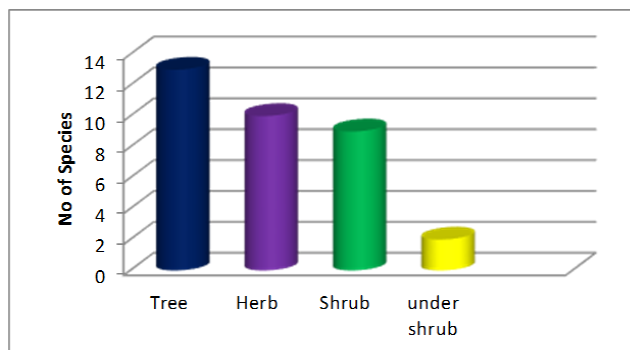


Fig. 2. Habit wise distribution of recorded medicinal plants from Yercaud hills.

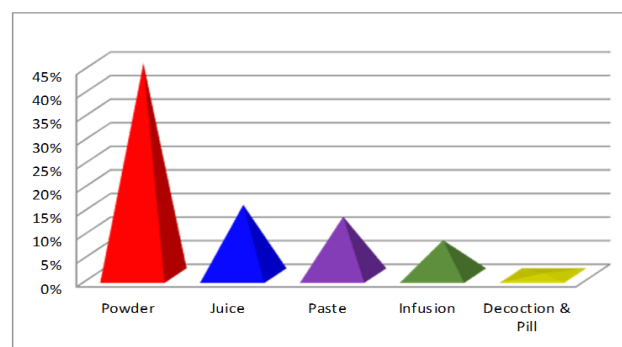


Fig. 4. Percentage of source of preparations used by Malayali Tribes for medicinal purpose.

beetle bite, epididymitis, bone fracture, arthritis and painful menstruation which are catalogued in Table 1. The traditional healers prepared the herbal formulation by use of vastly tree species. Among the 40 species, tree (13 species), herb (10 species), shrub (9 species), climber (6 species) and undershrub (2 species) were recorded and are represented in Fig. 2. Savinaya *et al.* (2016) also reported the advantages of different tree species as the dominant herbal medicine source. This was also due to the existence of the evergreen type of forest where the floor is covered maximum with budding forms of evergreen tree species likewise tall trees that form a ceiling from the sun above. This ceiling keeps smaller plants from growing. The most dominant plant parts by Malayali tribes in the study were leaves (16 species) which are commonly used in herbal medicines because they are rich in bioactive secondary metabolites; and also, the leaves are the main photosynthetic organs and act as the storage for exudates which are against lethal entities and also medicinal benefits to the human body (Ahmad *et al.* 2014) followed by bark (13 species), and root (5 species) other parts with the low number are listed; whole plant parts (2 species) and fruit, flower, rhizome and latex (1 species each) are shown in Fig. 3.

Malayali tribes are used various mode of preparation from medicinally important plants included paste, decoction, powder, juice, infusion, pill, chirm and raw material for curing various ailments. In our study the plant products are consumed raw or in the form of powder (45%), juice (15%), infusion (7.5%), decoction

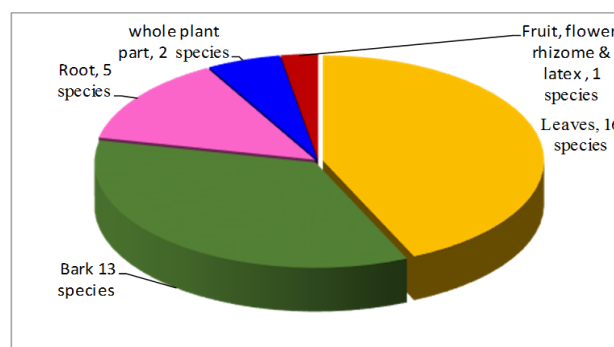


Fig. 3. Different types of plant parts used by Malayali tribes for medicine.

and pill (0.5%) for oral treatment and paste (12.5%) and chirm (0.5%) when applied externally (Fig. 4). The Malayali traditional healers used more than one plant for the preparation of medicine in the treatment of various ailments. The frequent use of multiple plant remedies among the traditional healers could be attributed to the belief of collaborative effect where one plant could have a potentiating effect on the other (Giday *et al.* 2009). Polyherbal formulations are more effective to treat the diseases as compared to the single plant (Teklehmanot *et al.* 2007).

The medicinal uses of plants gathered in the study were compared with the previously published information from Yercaud hills (Udayan and Satheesh George, 2006, Kadaval and Dixit, 2009, Parthipan *et al.*, 2011 and Senthilkumar *et al.*, 2013) and also from Eastern Ghats of Tamil Nadu (Dhatchanamoorthy *et al.* 2013, Salai Senthilkumar *et al.*, 2014 and Vaidyanathan *et al.*, 2014). The combination of herbals in our observation differed from the reports like Senthilkumar *et al.* (2013) who recorded that Malayali tribes in Yercaud hills used *Calotropis gigantea* for swellings, *Cassia occidentalis* for skin diseases, *Cynodon dactylon* for kidney disorder *Leucas aspera* for fever and stomachache, and *Ruta graveolens* for dysentery. But in our observation, these plants were used for the treatment of snakebite, dog bite, epididymitis, chest pain and arthritis, respectively. Anjalam *et al.* (2016) reported that Malayali tribes in Kolli hills used *Erythroxylum monogynum* leaves paste which acted as antipetide and in our findings bark of *Erythroxylum monogynum* was used for the antidote for the poisonous bite. Soniya and Raju (2017) documented *Azadirachta indica* for liver ailments, *Cardiospermum helicacabum* for rheumatic pains, *Cassia auriculata* for heart discomforts and *Datura metel* for chronic ulcer and asthma were similar to our findings. In addition, many of the ethnomedicinal plants reported during the present investigation are scientifically proved for various biological activities (Maluventhanviji *et al.*, 2016; Teklit and Tanveer, 2015; Hirave and Kondawar, 2016; Prathapa Reddy *et al.*, 2016; Trayee and Latha, 2016; Dhanunjava *et al.*, 2019; Turendra and Maheshkawale, 2019).

Conclusion

Medicinal plants that were traditionally used for different ailments in Yercaud hills by Malayali tribes in Tamil Nadu as well as all over the world contain a variety of chemical constituents and thus can be more effective and can play a significant role to cure different diseases and disorders. A comprehensive study is required to conserve these wild medicinal and aromatic plant species. Even though there is no existing database to deposit the documented traditional knowledge in the study area, elderly people of the local area were always satisfied with medicinal plants and their healing uses. It is, therefore, proposed that the traditional knowledge from the people should be documented along with quality photography. The documentation of this current study also supports the ethnomedicinal benefits, as stated in earlier studies.

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Conflict of interests

The authors declare that they have no conflict of interests.

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